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Claims:

1. I/Q-Demodulator comprising a n-port structure (1) being supplied with a RF signal (2) to be demodulated at a first input (3) and with a second RF-signal (4) at a second input (5),
and outputting n-2 signals (6) to power sensors (7), n being 4, 5 or 6,
characterized by
a multiplexing means (8) for multiplexing low-pass-filtered output signals (9) of the power sensors (7).

2. I/Q-Demodulator according to claim 1,
characterized in that
it comprises a single A/D converter (10) being supplied with an analog signal (11) originating from the multiplexing means (8) and outputting a digitally converted signal (12) to a digital processing unit (19).

3. I/Q- Demodulator according to claim 2,
characterized in that
the A/D converter (10') has an adaptive sampling rate.

4. I/Q- Demodulator according to claim 2 or 3,
characterized in that
the digital processing unit (19) comprises an adaptive baseband filtering unit (23).

5. I/Q-Demodulator according to anyone of the preceding claims,
characterized in that
the output signal of the power sensors (13) can be selectively passed through different low-pass-filters (14) having different cut-off-frequencies.

6. I/Q-Demodulator according to anyone of claims 1 to 5,
characterized by
switches (15) for the selection of the low-pass-filters (14).

7. I/Q-Demodulator according to anyone of the preceding claims,
characterized in that

the n-port is a five-port-junction (1).

8. I/Q-Demodulator according to anyone of the claims 1 to 6,
characterized in that
the n-port is a four-port-junction (16) and the demodulator is a (M)QAM or (M)PSK demodulator.

9. I/Q-Demodulator according to anyone of the preceding claims,
characterized in that
the multiplexing means is a DC-switch (8) with a switching time of $\frac{1}{n-2}$ times the symbol duration.

10. I/Q-Demodulator according to anyone of the preceding claims,
characterized in that
before or after the multiplexing means (8) at least one DC-amplifier (17) is provided.

11. I/Q-Demodulator according to anyone of the preceding claims,
characterized by
a low-pass-filter (20) following the multiplexing means (8) and having a cut-off-frequency of $\frac{n-2}{2}$B whereby the output signal of the power sensor (13) is low-pass-filtered with a cut-off-frequency of $\frac{B}{2}$ and B is the maximum bandwidth of the RF signal (2) to be demodulated.

12. I/Q-Demodulator according to anyone of the preceding claims,
characterized in that
the n-port (1,16), the power-sensors (7) and said multiplexing means (8) are integrated on one single chip (18).

13. Software radio device
characterized in that
it comprises an I/Q-demodulator (21) according anyone of the proceeding claims.

14. Method for I/Q-demodulation
comprising the following steps:
- inputting a RF-signal (2) to be demodulated in a n-port structure (1),
- inputting a second RF-signal (4) in a n-port structure (1),
- detecting (7) the power of n-2 output signals (6) of the n-port structure (1), n being 4,5 or 6,

- low-pass-filtering (14) the detected power signals (13),
- multiplexing the low-pass-filtered power signals (9).

15. Method according to claim 14,
characterized by the step of supplying
a single A/D converter (10) with the multiplexed power signals and outputting a digitally converted signal (12) to a digital processing unit (19).

16. Method according to claim 15,
characterized by the step of
adapting the sampling rate of the A/D converter (10) depending on the bandwidth of the RF signal (2) to be demodulated.

17. Method according to claim 14 or 15,
characterized in that
power signals (13) can be selectively filtered (14) with different cut-off-frequencies.

18. Method according to anyone of claims 14 to 17,
characterized in that
the step of multiplexing is implemented by a DC-switch (8) with a switching time $\frac{1}{n-2}$ of the symbol duration

19. Method according to anyone of claims 14 to 18,
characterized in that
the multiplexed power signals are low-pass-filtered (20) with a cut-off-frequency of $\frac{n-2}{2}$B whereby the non-multiplexed power signals are low-pass-filtered with the cut-off-frequency of $\frac{B}{2}$, where B is the maximum bandwidth of the RF signal (2) to be demodulated.